

SRS REPORT

ON

##### “VISITOR MANAGEMENT SYSTEM”

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INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY

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Certificate

This is to certify that the SRS report entitled

“**VISITOR MANAGEMENT SYSTEM**”

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have partially completed the Project entitled ” **VISITOR MANAGEMENT SYSTEM**”, under my guidance in partial fulfillment of the requirement for the Project Based Learning in S.E. Information Technology of International Institute of Information Technology, Hinjewadi, by Savitribai Phule Pune University for the academic year 2022 – 2023.

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Abstract:

The Visitor Management System with Face Detection and WhatsApp Integration is a project aimed at enhancing the security and efficiency of visitor management processes. This system utilizes facial recognition technology to detect and identify visitors, allowing administrators to efficiently approve or request visitors to wait via WhatsApp messaging.

The primary objective of this project is to streamline the visitor management process by automating visitor identification and communication with the help of advanced technologies. The system consists of two main components: the face detection module and the WhatsApp integration module.

The face detection module utilizes computer vision algorithms to capture and analyze the facial features of visitors as they approach a designated entry point. By comparing the detected faces against a pre-existing database of authorized individuals, the system can accurately identify whether a visitor is known or unknown. This real-time facial recognition capability significantly enhances security by alerting administrators of potential threats or unauthorized access attempts.

Upon successful facial recognition, the system enables the administrator to promptly approve the visitor for entry or request them to wait for further verification. The WhatsApp integration module allows administrators to send instant messages to visitors via WhatsApp, providing clear instructions and updates. Through this integration, administrators can efficiently communicate with visitors, saving time and enhancing the overall visitor experience.

The Visitor Management System aims to offer several benefits. Firstly, it increases the security level by accurately identifying visitors and promptly notifying administrators of potential security risks. Secondly, it improves the efficiency of visitor management by automating the identification and approval process, reducing manual effort and wait times. Lastly, the WhatsApp integration enhances communication between administrators and visitors, ensuring effective information exchange and a seamless experience.

In conclusion, the Visitor Management System with Face Detection and WhatsApp Integration is a powerful tool that revolutionizes traditional visitor management processes. By leveraging facial recognition technology and integrating with WhatsApp messaging, this system provides enhanced security, improved efficiency, and effective communication, making it an invaluable asset for organizations that prioritize visitor management and security.

# Chapter 1

## Introduction to Project Topic

**1.1 Overview:**

The Visitor Management System with Face Detection and WhatsApp Integration is a software project designed to revolutionize the way visitors are managed within organizations. By leveraging facial recognition technology and integrating with WhatsApp messaging, the system aims to enhance security, improve efficiency, and streamline communication between administrators and visitors. This project applies software engineering principles to develop a robust and user-friendly solution that addresses the challenges faced in traditional visitor management systems.

**1.2 Brief Description:**

The project focuses on developing a visitor management system that incorporates cutting-edge technologies to automate the identification and approval process. The system utilizes facial recognition algorithms to detect and analyze visitors' faces as they approach a designated entry point. This allows for real-time identification and comparison against a database of authorized individuals. Additionally, administrators can communicate with visitors through WhatsApp messaging, providing instructions and updates.

**1.3 Problem Definition:**

Traditional visitor management systems often rely on manual processes, such as paper sign-in sheets or identity verification through physical documents. These methods are time-consuming, prone to errors, and lack efficiency. Moreover, there may be delays in communication between administrators and visitors, leading to confusion and inconvenience. The project aims to address these challenges by developing an automated system that seamlessly integrates face detection and WhatsApp messaging to streamline the visitor management process.

**1.4 Applying Software Engineering Approach for the Project:**

Task 1: Business Problem:

The initial task involves identifying and understanding the business problem associated with the current visitor management system. This includes conducting a thorough analysis of the limitations, inefficiencies, and security concerns. The project team will engage with stakeholders, gather requirements, and define the specific objectives and goals for the new system. This task aims to ensure that the project addresses the organization's unique needs and aligns with its strategic objectives.

Task 2: Planning:

During the planning phase, the project team will create a comprehensive project plan. This involves defining project scope, establishing timelines, allocating resources, and identifying potential risks and mitigation strategies. The team will also determine the necessary hardware, software, and infrastructure requirements for the Visitor Management System. A well-defined plan will guide the project's execution, ensuring that it stays on track and meets its objectives.

Task 3: Design:

In the design phase, the project team will create the architectural and functional design of the Visitor Management System. This includes designing the database schema, user interface, and system components. The team will also define the algorithms and techniques required for facial recognition and integrate the WhatsApp messaging functionality. Security measures, such as data encryption and access controls, will be incorporated into the design to protect visitor information. This task aims to ensure that the system is well-structured, scalable, and user-friendly.

Task 4: Construction:

The construction phase involves the actual implementation of the Visitor Management System based on the design specifications. The project team will develop the software, configure the database, and integrate the necessary modules. This task includes coding, testing, and debugging to ensure the system's functionality and reliability. The team will follow coding best practices, adhere to coding standards, and perform regular code reviews to maintain code quality throughout the development process.

Task 5: Deployment:

During the deployment phase, the project team will prepare the Visitor Management System for deployment in the organization. This involves conducting thorough testing, including unit testing, integration testing, and system testing, to verify that the system meets the defined requirements. User acceptance testing will be performed to ensure that the system is intuitive and meets the needs of the administrators. Once testing is complete, the system will be deployed in a production environment, and training and support materials will be provided to users and administrators. Ongoing maintenance and support plans will also be established to address any future issues or updates.

By following this software engineering approach, the project team can effectively address the business problem, plan and design the system, construct the solution, and successfully deploy it. This approach ensures that the Visitor Management System is developed in a systematic and structured manner, meeting the organization's requirements and delivering a reliable, secure, and efficient solution for managing visitors.

# Chapter 2

## Literature Survey

|  |  |  |  |
| --- | --- | --- | --- |
| **Title** | **Algorithm** | **Result** | **Drawback** |
| Analysis of Segmentation Method for Brahmi Script | 1)Line Segmentation  2)word into characters segmentation | Every optical character recognition (OCR)  system involves a specific type of segmentation module, where decisions are taken for dividing a document image text into its fundamental parts like text line, words, characters, or sub-characters. | This method may not produce a similar  satisfactory result for other inscriptions of Brahmi.  Lack of clear definition of segmentation. |
| Handwritten Optical Character Recognition(OCR):A Coprehensive Systematic Literature Review(SLR) | Classification Techniques in OCR  1)Artificial Neural  Networks (ANN)  2)Structural pattern recognition | This review paper summarizes research that has been conducted on character recognition of handwritten  documents and to provided research directions. | OCR is time-consuming and expensive.  Accuracy is given by the Multilayer perceptron classifier. |
| Data Driven Approach to Brahmi OCR Error Correction and Sinhala Meaning Generation from Brahmi Character Array | Optical Character Recognition  (OCR) | Detects OCR errors which can be happened in the character recognition stage and  misspelled words | The results produced are not grammatically correct since the main concern of this system  is the OCR error correction modules and Brahmi language  model. |
| Optical Character Recognition for Brahmi Script Using Geometric Method | Optical Character Recognition (OCR)  1)Optical scanning  2)Preprocessing  3)Segmentation  4)Feature extraction  5)Character Classification | The accuracy of this proposed method  is 94.10% and 90.62% for printed and handwritten Brahmi  character recognition respectively. | The accuracy is only 90.62 for handwritten characters and can be improved by using SVM and Neural network |
| Text Extraction and Recognition from Image using Neural Network | 1)Optical Character Recognition (OCR)  2)Color Reduction  3)ROI Identification and Feature  Extraction | An unconstrained image indexing and retrieval system using  neural network is modeled. | 1)Compressed domain processing to make it even faster.  2)system cannot detect non-horizontally text in an image.  3)improvement of  our method for better tracking of text with complex motion.  4)system is poor for  text with complex backgrounds.  5)a more accurate OCR  will also improve the quality of retrieval further. |
| Thresholding: A Pixel-Level Image Processing Methodology Preprocessing Technique for an OCR System for the Brahmi Script | 1)Thresholding algorithms  2)Quadratic Integral Ratio(QIR) algorithm,  3)OTSU algorithm | The majority of the results from Otsu have too much of noise in the form of the background being detected. It can be used for thresholding if the noise removal and character recognition implementations are  really good. | The proposed preprocessing algorithm gives fairly average results. Its accuracy needs to be improved. |
| Handwriting Recognition of Brahmi Script (an  Artefact): Base of PALI Language | Modified Optical Character Recognition (MOCR) for text recognition | Through all the evaluations done the overall performance is  about 85.4 % of OCR.  Its complete performance analysis is 88.83%. | Needs improvement in terms of performance, with changes in extraction in order to gain high accuracy. |
| Recognition and translation of Ancient  Brahmi Letters using deep learning and NLP | NLP Techniques for processing and Google Trans library for translation | Proposed automatic method to analyze, recognize and translate the ancient Brahmi script using image processing, deep learning, and Natural Language processing. | Cannot handle a large amount of data while compiling the model.  Fails to provide a more descriptive meaning of the ancient inscriptions. |
| Creation of precise alphabet fonts of early Brahmi script from photographic data of ancient Sri Lankan  inscriptions | Majority Algorithm for creating font image | Fonts of early Brahmi script have been produced on the basis of "majority algorithm". | Needs too much data for training. |
| Tamil-Brahmi Script character recognition system using deep learning technique | Convolutional Neural Network (CNN)  1) Data Collection  2) Cropping  3) Normalizing Image Inputs  4) Dimensionality Reduction  5) Data Augmentation | This Tamil-Brahmi Character Recognition model has an accuracy of 94.6 % | cannot detect the inscriptions from rock engravings and manuscripts.. |

# Chapter 3

## Software Requirements Specification

Visitor’s Management System

Software Requirements Specification (SRS) for Visitor Management System

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1. Introduction:

The Visitor Management System is a software system designed to manage visitors in a company or organization. The system will facilitate the check-in and check-out process, capture visitor information and Face, and ensure the security of the premises.

#OBJECTIVES OF PROJECT:

1. Maintain the visitor’s entry easily and Facilitate visitor the ease to register.
2. Keep workspace Safe .
3. Securing Clients Building.

#Scope of Project:

->the project is custom software to manage visitor’s in an institute.

1. Working :

->When person comes to meet the Admin the webcam will Scan their faces.

->After Scanning the System will check the person’s data is available in database or not.

->Searching will be done by their given their face.

->If the person’s data is available in database the System will fetch his/her ‘

Name, Contact Number . `

->The Information about the visitor is displayed on admin’s System.

->The Admin will then decide whether to Allow the person to visit,

Put him/her on waiting list.

->If the admin don’t respond within 1 min the System will send a Automated

Whatsapp message to visitor mentioning that “Sorry!!Admin is not Available right now , please try after some time.”

1. Functional Requirements :

The system shall have the following features:

2.1. Visitor Registration

-> The system shall allow the user to register new visitors.

-> The system shall require the visitor’s ID, name, phone number.

-> The system shall capture a photo of the visitor for identification purposes.

2.2. Check-In

-> The system shall allow the user to check-in visitors.

-> The system shall verify the visitor’s identity by matching the photo with the registered information.

2.3. Visitor Logs

-> The system shall maintain a log of all visitor activity.

-> The system shall record the visitor’s name, check-in.

-> The system shall allow the user to search and filter the visitor log by date, time, visitor name.

-> Notifications

-> The system shall send notifications to the Admin when their visitor checks in.

4. Non-Functional Requirements :

3.1 Usability

-> The system shall have a user-friendly interface.

-> The system shall be easy to navigate.

-> The system shall provide clear instructions to the user.

3.2. Performance

-> The system shall be able to handle a high volume of visitors.

-> The system shall respond to user input within 2 seconds.

3.3. Security

-> The system shall require a login for access.

-> The system shall use secure encryption to protect visitor data.

-> The system shall restrict access to visitor data to authorized users.

3.4. Compatibility

-> The system shall be compatible with Windows, macOS, and Linux operating systems.

-> The system shall be compatible with Windows 7/8/10 and Above.

5. Constraints :

4.1. Hardware Requirements

-> The system shall require a computer with a minimum of 4 GB RAM.

-> The system shall require a webcam for capturing visitor Face.

6 .Software Requirements :

->The Visitors Management System shall allow authorized personnel to register and manage visitors.

->The system shall maintain a database of all registered visitors.

->The system shall allow authorized personnel to view the visitor database and generate reports.

->The system shall Recognize the Student or Faculty member as their data and face is already present in System.

->The system shall send notifications to admin when their visitors arrive.

->The system shall allow Admin to pre-register visitors.

->The system shall allow visitors to check-in

->The system shall restrict access to sensitive areas to authorized personnel only.

->The system shall maintain a log of all system activities.

7. Use Case Diagram:

The use case diagram for the Visitors Management System is shown below:

A picture containing sketch, drawing, diagram, line art

Description automatically generated

8 .Testing Plan :

The testing plan for the Visitors Management System shall include the following steps:

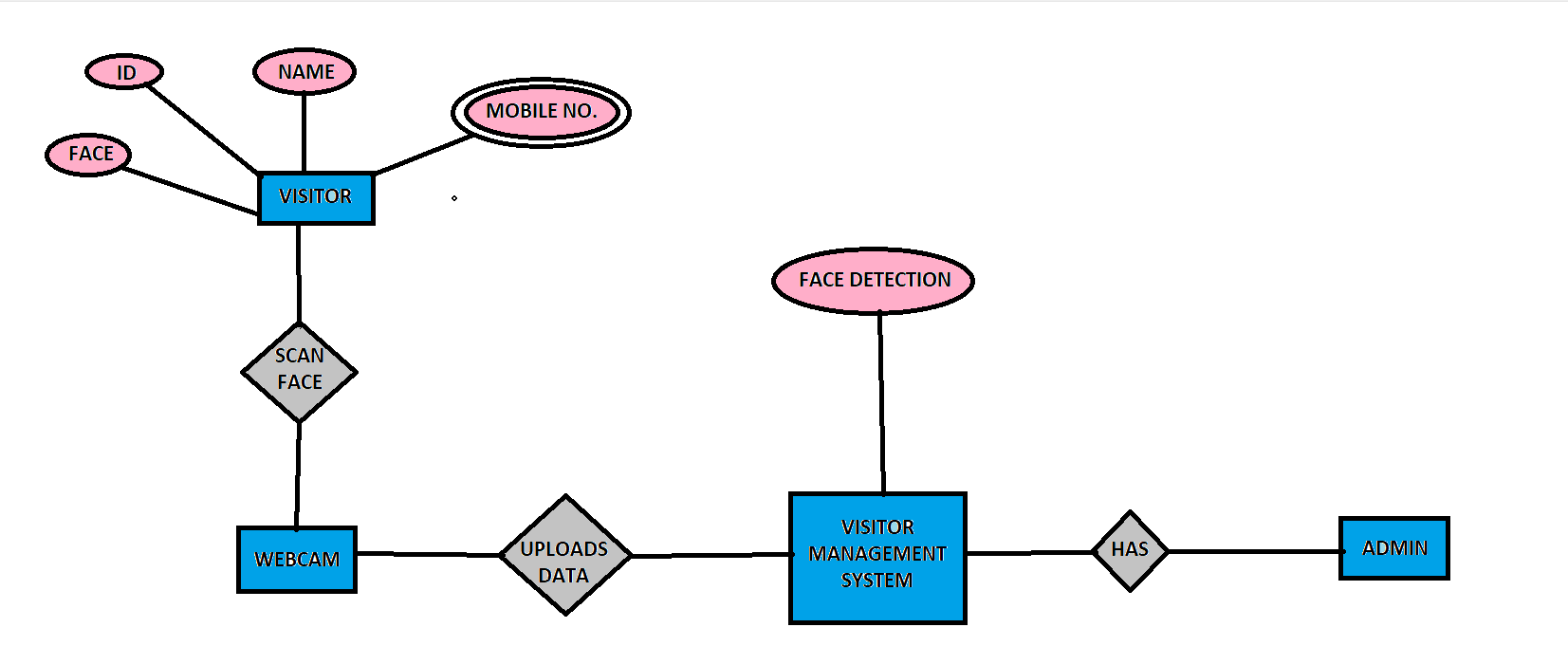
->Unit Testing: Each module shall be tested individually to ensure its functionality.

->Integration Testing: Modules shall be tested in combination to ensure they work together as expected.

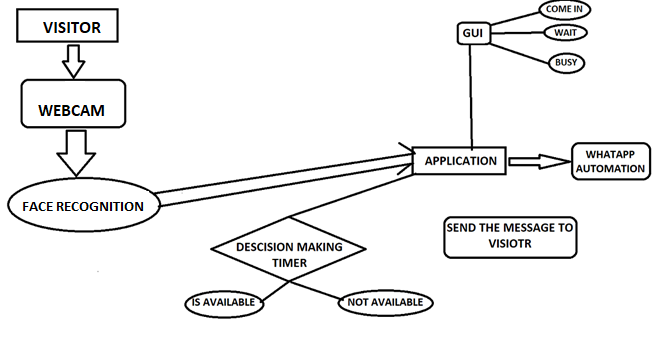
->System Testing: The entire system shall be tested to ensure it meets the system requirements.

->Face Recognition Test: The system shall be tested by users to ensure it Recognize the Authorized persons.

9. E – R Model :



10.Data Flow Diagram:



10. Project Plan :

The project plan for the Visitors Management System shall include the following steps:

Requirements Gathering: Gather system requirements from Internet.

Technology Requirement: Face Recognition and databases.

Design: Develop a design for the system based on the requirements.

Implementation: implement the system.

Testing: Test the system to ensure it meets the system requirements.

Maintenance: Provide ongoing maintenance and support for the system.

11 .References :

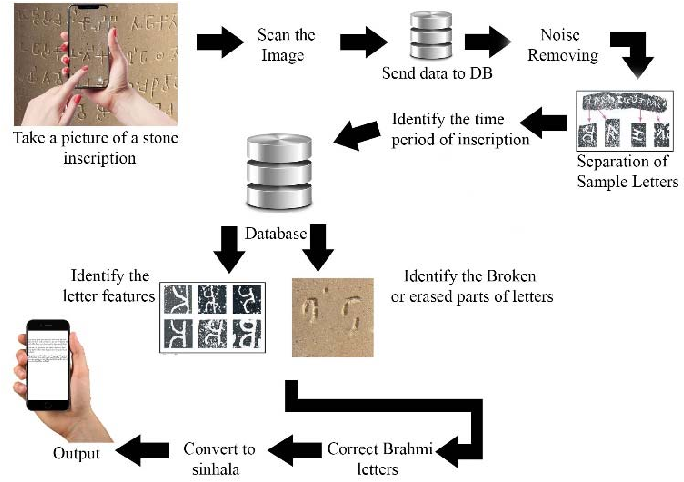
"Visitor Management System." TechTarget, 2021,

<https://www.swipedon.com/blog/what-is-visitor-management>

# Chapter 4

## System Design

### System Architecture



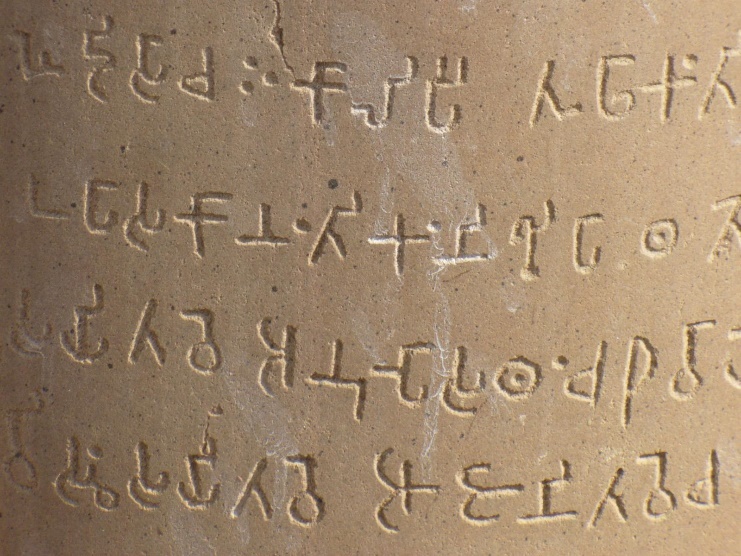


Fig. Some Brahmi Characters

### UML Diagrams

#### Class Diagram

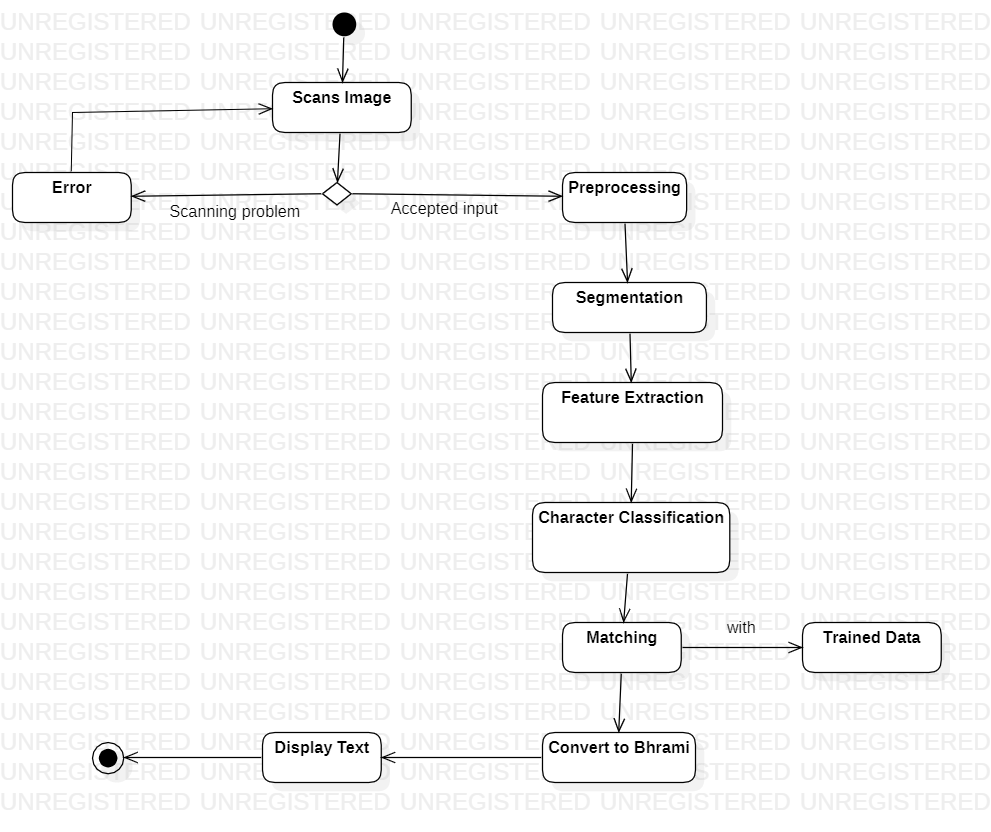


#### Use Case Diagram

.



#### Activity Diagram



# 

# Chapter 5

## Technical Specification

### Technology Details used in the project:

* **Planning and Innovation**

Innovation:

➔ IEEE Xplore

Software analysis, architecture and design:

➔ Flow charts, UML diagrams, Analysis Model

UML tools, and techniques:

➔ Draw.io, Figma,Creately.com

**● Implementation**

Programming languages:

➔ Python

Technologies, libraries, and frameworks:

➔ Tensorflow, Keras, ImageDataGenerator, Django

Platform:

➔ Jupyter Notebook, Google Colab, Anaconda

* Python: Python is a general purpose programming language. It emphasizes on ease of use and quick prototyping.
* Tensorflow: TensorFlow is a free and open-source software library for machine learning and artificial intelligence. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.
* Keras: Keras is an open-source software library that provides a Python interface for artificial neural networks. Keras acts as an interface for the TensorFlow library.

# Chapter 6

## Conclusion

Nowadays, many applications or researchers need several kinds of images as sources of information for research and analysis. It's a very tedious job to search for images and one by one extract the text from the images manually. Many people try to store this data in a digitized form. But when an image is transformed from one form to another such as digitizing, scanning, communicating, storing, etc. degradation occurs. Therefore, the output image has to undertake a process called image enhancement, which contains a group of methods that seek to develop the visual presence of an image. Image enhancement is fundamentally enlightening the interpretability or awareness of information in images for human listeners and providing better input for other automatic image processing systems.

This system will enable us to read and understand the writing written in the Brahmi language on the walls of some ancient forts. Conversion of Brahmi scripts into natural language will enable people from all around the world to understand the words written. Different methods can be used for the recognition of handwritten and printed Brahmi characters. A model is being trained which is able to recognize the input characters and search for the matching results in the database provided. It can be achieved by image processing techniques which are image preprocessing, segmentation, feature extraction, and conversion into natural language.

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recognition in real-world images. In ACCV, pages 770–783, 2010.

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